

Innovative CO2 Analyzer Technology for the Eddy Covariance Flux Monitor, Phase I

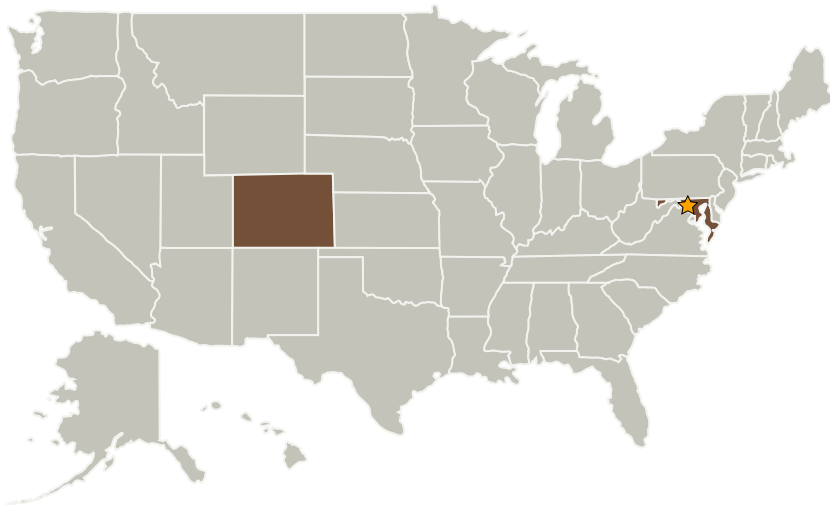
Completed Technology Project (2007 - 2007)



Project Introduction

We propose to build and evaluate NDIR Analyzers that can observe eddy covariance flux of CO2 from unmanned airborne platforms. For both phases, a total of four analyzers are to be evaluated for their noise (ppb rms, Dry Mole Fraction) and susceptibility to artifacts on platform. We present original framework for their evaluation. It consists of expressions for their potential noises, artifacts and the functionality of their electro-optical processors on platform. Phase I begins with the construction of two innovative NDIR analyzers, one close- and the other open-path. Each is based on the industry-standard airborne analyzer made by the proposing corporation. It is solid-state, runs at 8 Hz and has negligible sensitivity to motion. We propose existing technologies to increase the electro-optical modulation frequency to 100 Hz. The rms sensitivity (ppb), the level of drying and frequency response to air will be documented. The goal is a technology having the air sampling frequency of 100 Hz, rms sensitivity of 100 ppb and negligible artifacts, the target specifications of NASA's Southern Ocean Initiative. The plan for Phase II will be to evaluate the analyzers by observations of eddy covariance flux made from unmanned and piloted aircraft above terrestrial and marine ecosystems.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Atmospheric Observing Systems, Inc.	Supporting Organization	Industry	Boulder, Colorado

Primary U.S. Work Locations

Colorado	Maryland
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.7 Innovative RF Technologies